eliminated.

521.07 Method of Measurement Expansion Device - Finger Joint will be measured by each unit, complete in place and accepted. Each unit shall consist of one pair of matching devices including anchorage system, curb and sidewalk expansion dams, barrier sliding plates as required, and if shown on the plans, trough or curtain components, downspouts and chutes.

Fabric trough or curtain for finger joint will be measured for payment by each unit complete in place and accepted.

521.08 Basis of Payment The accepted quantity of Expansion Device - Finger Joint will be paid for at the contract unit price each, which payment shall be full compensation for all materials including anchorage system, curb and sidewalk expansion dams, barrier sliding plates, trough or curtain support systems, downspouts and chutes, galvanizing, equipment, labor and incidentals necessary for furnishing and installing the expansion devices and expansion dams. The accepted quantity of fabric trough or curtain for finger joint will be paid for at the contract price each, complete in place and accepted, which price shall include all materials, equipment, tools and labor incidentals thereto.

Payment will be made under:

Pay Item		Pay Unit
521.23	Expansion Device - Finger Joint	Each
521.32	Fabric Trough for Finger Joint	Each
521.33	Fabric Curtain for Finger Joint	Each

SECTION 522 - EXPANSION DEVICES - MODULAR

522.011 Description This work shall consist of furnishing and installing shop fabricated modular expansion devices. This shall include, but not be limited to, neoprene seal elements, steel transverse dividers and end channels, support bars and bearings, anchorages, sidewalk, median and curb expansion dams and barrier slide plates, all as specified herein or specified in the Contract documents.

522.012 Materials Materials shall meet the requirements specified in the following Sections of Division 700 -

Materials:

Stud Shear Connectors, Anchor and Fasteners	711.06
Structural Steel	713.01
High Strength Bolts	713.02
Steel Extrusions	713.08
Lubricant Adhesives	714.03
Gland Type Seals	714.06

All steel divider bars, end channels and support bars shall conform to the requirements of ASTM A572/A572M Grade 345 [Grade 50] Steel. Other steel plates shall conform to the requirements of ASTM A36/A36M or ASTM A572/A572M. Shapes shall conform to the requirements of ASTM A500, Grades A and B, or ASTM A992/A992M. Other weldable steels may be used with the approval of the Fabrication Engineer. The entire assembly, unless otherwise indicated on the contract plans, shall be hot dip galvanized in conformance with AASHTO M111 (ASTM A123). All miscellaneous materials such as stainless steel sliding surfaces, bearings, etc. shall be as recommended by the manufacturer, and as approved by the Fabrication Engineer. The manufacturer shall submit full information on material specifications and dimensional data for approval.

522.013 Design The modular expansion devices shall incorporate divider bars, end channels, divider bar supports, seals, a system to maintain the seals at a substantially equal spacing at all times, and joint armor incorporating a support system for the divider bar supports and an anchoring system for fixing the expansion device to the supporting concrete. The expansion devices shall be capable of accommodating the movements specified on the design drawings.

The system maintaining the seal spacing shall be subject to prior approval by the Fabrication Engineer and shall be a design that does not employ a rigid scissors type mechanical system. The seal spacing system shall at all times exert a positive control force, and shall have a certain amount of flexibility to absorb shock loads such as snowplow impacts.

The sealing elements shall be gland type seals, and shall be fabricated with lugs or other protrusions designed to have a positive interlocking action with the divider bars. Sealing elements that are continuous over the full width of the joint, and require a clamping element to fix the sealing element to the top surface of the divider bar(s), will not be accepted. The minimum joint opening between adjacent divider bars shall be 12 mm [½ in], and the maximum joint opening shall be 89 mm [3½ in].

The divider bars and end channels shall be extruded or rolled shapes, designed to positively interlock with the sealing elements, and capable of sustaining all vertical and horizontal loads imposed by the traffic.

The divider bar supports shall be supported on the joint armor in a manner incorporating sufficient flexibility to absorb vertical shock loads.

The divider bars, divider bar supports and associated bearings, hardware, etc. shall be designed in accordance with the AASHTO LRFD Bridge Design Specifications. The manufacturer shall submit computations and data to verify appropriate load carrying capacity and said computations shall show conformance to all applicable requirements, including fatigue criteria, of the AASHTO LRFD Bridge Construction Specifications.

522.014 Fabrication The expansion joints shall be shop assembled in accordance with the manufacturer's recommendations and in conformance with the details shown in the Contract documents and in these specifications.

All work shall be in accordance with the applicable provisions of Section 504 - Structural Steel. Twenty-five percent of full penetration welds shall be ultrasonic tested. Twenty-five percent of fillet welds and partial penetration welds shall be inspected by magnetic particle. Acceptance criteria shall be in accordance with the AWS D1.5 Bridge Welding Code. All shop welding shall be completed to the greatest extent possible before the steel is galvanized. Any welds to be made after the steel is galvanized shall be identified on the Shop Drawings. Steel surfaces welded subsequent to galvanizing shall be repaired to the requirements of ASTM A780 and Annexes A1, A2 or A3. The dry film thickness shall be within the range of 75 µm to 120 µm [3 mils to 5 mils]. Damaged areas of the galvanizing shall be similarly treated.

The galvanizing on the metal surfaces in direct contact with the neoprene seals shall be lightly sandblasted to a dull gray appearance to provide a high strength bond between the seal and mating metal surfaces, and to provide an appropriate surface smoothness for installation. Alternately, this galvanized surface may be prepared to the published manufacturer’s recommendations for installation and bonding of the seals.

Seal elements shall be furnished and shop installed in one continuous length. Splices in seals will be permitted at abrupt changes in horizontal alignment. Abutting surfaces of splices shall be shop-vulcanized together.

The Contractor shall submit computations, Shop Drawings, erection drawings, and other Working Drawings in accordance

with Section 105.7 - Working Drawings.

The fabricated expansion device shall be preset by the manufacturer, before shipment, to the dimensions for 7°C [45°F]. Hardware for leveling, shipping and adjusting the device shall be supplied as part of the assembled expansion device. Final width adjustments of the prefabricated expansion device shall be made at the direction of the Resident, in the field, prior to the final concrete placement.

522.015 Delivery Modular expansion devices shall be delivered to the job site in one unit, fully assembled. No field joints will be allowed, unless shown on the design drawings or approved by the Fabrication Engineer before shop fabrication.

522.016 Installation Following completion of the structural deck slab, the expansion devices shall be installed in the blocked out portion of the slab and abutment backwall. Following final adjustment, the device shall be permanently fixed in place, all shipping and adjustment devices shall be removed, surfaces shall be repaired as specified in Section 522.014 - Fabrication, and concrete shall be placed to complete the deck slab and backwall to the lines and grades shown on the design drawings.

522.017 Method of Measurement Modular Expansion Devices will be measured by each unit, complete in place and accepted. Each unit shall consist of a modular expansion device, including anchorage system, seals, shipping and temperature adjustment devices, curb, sidewalk and median expansion dams and barrier sliding plates, as required.

522.018 Basis of Payment The accepted quantity of Modular Expansion Devices will be paid for at the contract unit price each, which payment shall be full compensation for all materials, equipment, labor and incidentals necessary for furnishing and installing the expansion devices, curb, sidewalk and median expansion dams and barrier sliding plates, as required.

Payment will be made under:

Pay Item		Pay Unit
522.06	Modular Expansion Devices	Each